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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/687,495	10/13/2000	Sean Timothy Crowley	45475-0001999-58164	9398
7663	7590	10/08/2003	EXAMINER	
STETINA BRUNDA GARRED & BRUCKER			GEYER, SCOTT B	
75 ENTERPRISE, SUITE 250			ART UNIT	
ALISO VIEJO, CA 92656			PAPER NUMBER	

2829

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/687,495

Applicant(s)

CROWLEY ET AL.

Examiner

Scott B. Geyer

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,4-7,13,14,17-23 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,4-7,13 and 17-20 is/are rejected.
- 7) ☐ Claim(s) 14,21-23 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 17 September 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The instant office action addresses pending claims 1, 4-7, 13, 14, 17-23 and 25 on their merits, with claims 1, 13 and 19 being independent claims.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed via fax on 9-15-03 (originally filed 5-5-03) has been entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 5, 7 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Pavo (5,528,076).

4A. As to **claim 1**, Pavo teaches a semiconductor chip 30 having an upper surface provided with a plurality of input/output pads 32. The chip 30 is mounted on a

chip paddle (mounting area) 12, which has an upper and lower surface. A plurality of leads 26,27 having upper and lower surfaces surround the chip paddle 12. As can be clearly seen in figure 3, the chip paddle 12 has a maximum thickness which is greater than the maximum thickness of the leads 26,27. Conductive wires connect the chip 30 to the leads 26,27. Also as shown in figure 3, a package body is formed around the device such that the chip, wires chip paddle and leads are encapsulated, leaving bottom portions of the chip paddle and the leads exposed.

4B. As to **claim 5**, Pavo teaches the bottom surface of the chip 30 bonded to the chip paddle 12 with an adhesive (column 4, lines 23-26).

4C. As to **claim 7**, Pavo teaches the lower surfaces of the leads 26,27 exposed in the package body.

4D. As to **claim 19**, Pavo teaches a semiconductor chip package in figure 3. The package has a chip paddle 12 wherein a surface of the chip paddle is exposed in the package and a plurality of leads 26,27 wherein a surface of each of the leads is exposed in the package. The package has means for receiving encapsulating material and a means of providing a fluid path for the encapsulating means, since the package in figure 3 is encapsulated. The package has means for locking the encapsulating means to the chip paddle as shown in figure 3, since the chip paddle has a maximum thickness which is greater than the maximum thickness of the leads and a void is formed due to the difference in the thicknesses.

Art Unit: 2829

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 4, 6, 7, 13 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Carter, Jr. et al. (6,211,462 B1).

5A. As to **claim 1**, Carter, Jr. et al. teach in figures 2a/2b a chip package 210 wherein a chip 200 with a plurality of input/output pads is mounted on a chip paddle (pad) 201, the chip paddle having upper and lower surfaces. A plurality of leads 203 surround the chip paddle 201 wherein the leads have upper and lower surfaces, and wherein the chip paddle 201 has a maximum thickness greater than the maximum thickness of the leads 203. Conductive wires 206 are attached to the chip 200 and the leads 203 and an encapsulant 207 is used to encapsulate the chip, the wires, the chip paddle and the leads, leaving bottom portions of the chip paddle and the leads exposed.

5B. As to **claim 4**, Carter, Jr. et al. teach the bottom surfaces of the leads and the chip paddle in a common plane, as is shown in figure 2a.

5C. As to **claim 7**, Carter, Jr. et al. teach the lower surfaces of the leads 203 exposed in the package body.

5D. As to **claim 13**, Carter, Jr. et al. teach in figures 2a/2b a chip package 210 wherein a chip paddle 201 is adapted to receive a chip 200 and the chip paddle has a lower surface, an upper surface and an intermediate surface positioned between the upper and lower surfaces and parallel to the upper and lower surfaces. A plurality of leads 203 surround the chip paddle 201. As shown in figure 2a, the intermediate

surface of the chip paddle and the upper surface of the leads are in approximately a common plane. Also, the chip paddle 201 has a maximum thickness greater than a maximum thickness of the leads. Further, the leadframe is adapted to receive a package body of encapsulant as depicted in figure 2a, wherein the encapsulant material encapsulates the chip paddle and the leads. Finally, Carter, jr. et al. teach portions of the chip paddle and the leads exposed in the package body.

5E. As to **claim 18**, Carter, Jr. et al. teach in figure 2a the lower surfaces of the leads exposed externally in the package body.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter, Jr. et al. (6,211,462 B1) in view of Sharma et al. (6,420,779 B1).

7A. As to **claim 6**, Carter, Jr. et al. teach the leads having an etched part on the sides of the leads (column 6, lines 1-18). Carter, Jr. et al. do not specifically teach the etched part of the leads at an end of the lead facing the chip paddle. However, Sharma et al. teach an etched end of the leads 130,140 on the ends facing the chip paddle 120, in figure 1. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the etched leads of Carter, Jr. et al. to having etched

ends as taught by Sharma et al. so as to enhance the locking feature capabilities of the encapsulant between the leads and the chip paddle.

7B. As to **claim 17**, Sharma et al. teach an etched end of the leads 130,140 on the ends facing the chip paddle 120, in figure 1.

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pavio (5,528,076) in view of Sharma et al. (6,420,779 B1).

8A. As to **claim 20**, Pavio teach all of the claimed limitations of claim 20 except for an etched portion on the lower side of the chip paddle. However, Sharma et al. teach the chip paddle 120 in figure 1 having an etched portion. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the chip paddle of Pavio with an etched portion as taught by Sharma et al. to provide a locking feature for the encapsulant material to the semiconductor package.

Allowable Subject Matter

9. Claims 14 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record and to the examiner's knowledge does not teach or render obvious, at least to the skilled artisan, the instant invention regarding the chip paddle having a lower side etched, wherein the etched part is between 10% and 90% of the lower side area of the chip

Art Unit: 2829

paddle, as recited in claims 14 and 21. Claims 22, 23 and 25 are dependent upon claim 21.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott B. Geyer whose telephone number is (703) 306-5866. The examiner can normally be reached on weekdays, between 10:00am - 6:30pm. E-mail: scott.geyer@uspto.gov

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (703) 308-1233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SBG.

SBG
September 26, 2003


EVAN PERT
PRIMARY EXAMINER